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NOTES ON AMPHISBAENIDS (AMPHISBAENIA; REPTILIA). 10. REDESCRIPTION AND REDEFINITION OF *AMPHISBAENA PERICENSIS* NOBLE FROM THE MOUNTAINS OF NORTHWESTERN PERU.

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In 1921 Noble described the new species *Amphisbaena pericensis*, basing his description upon a single specimen (MCZ. No. 14631) collected by him, while a member of the "Harvard Peruvian Expedition of 1916." The holotype came from "Perico, Peru," but Noble added that the species was represented in the collection by a "large series of specimens." He neither listed, nor otherwise commented upon these, except to state the range of the form as the "arid valleys of the Chinchipe and Marañon, from Perico on the north to Bellavista on the south."

The series of specimens referred to has never been discussed in the subsequent literature. The only reference to additional specimens was made in error. S.U. 8314-8315 (Burt and Myers, 1942, p. 48) actually were *A. occidentalis townsendi* from the Pariñas Valley. Our concept of *A. pericensis* thus still rests upon the description of the holotype. Half of the remaining specimens, referred to as paratypes with but faint justification, have been traded to at least eight other museums. The form has had repeated mention in catalogs and specimen lists (Barbour and Loveridge, 1929; Burt and Burt, 1930, 1931; Cochran, 1961; Marx, 1958).

The present notes are based upon the re-assembly of a significant fraction of the original series. They include a redefinition and standardized redescription (cf. Gans and Alexander, 1962), coupled with the first illustration of the form.

I am indebted to the following curators of institutions (identified throughout by the abbreviations given in parentheses) for permission to borrow or examine material in their care: Mr. Charles M. Bogert of the American Museum of Natural History

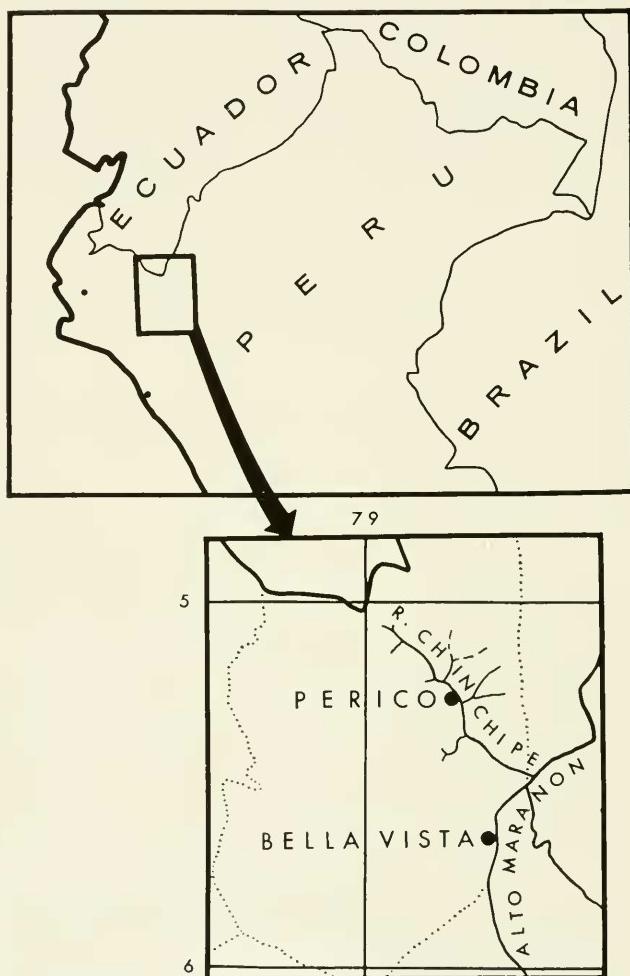


FIG. 1. *Amphisbaena pericensis*. Map showing localities mentioned in the text. The two small dots in the small scale map indicate the type localities of *Amphisbaena o. occidentalis* Cope [bottom or south], and *A. o. townsendi* Stejneger [top or north]. The dotted line on the large scale [detail] map indicates the Province of Jaén of the Department of Cajamarca, Peru.

(A.M.N.H.), Miss Alice G. C. Grandison of the British Museum (Natural History) (B.M.), Dr. Alan Leviton of the California Academy of Sciences at San Francisco (C.A.S.), Mr. Hyman Marx and Dr. Robert F. Inger of the Chicago Natural History Museum (C.N.H.M.), Dr. Ernest E. Williams of the Museum of Comparative Zoology (M.C.Z.), Dr. Konrad Klemmer of the Senckenbergische Naturforschende Gesellschaft of Frankfurt a. M., Germany (S.M.F.), Dr. George S. Myers of Stanford University, Museum of Natural History (S.I.), Dr. Hobart M. Smith of the University of Illinois Museum of Natural History (U.I.M.N.H.), Dr. Doris M. Cochran of the United States National Museum (U.S.N.M.), and Dr. Heinz Wermuth [formerly] of the Zoologisches Institut der Universität in Berlin (Z.M.U.). Dr. Virginia Cummings figured the specimen and Miss Charlyn Rhodes furnished technical assistance. The overall project has been supported by grants NSF G-9054 and G-21819 from the National Science Foundation.

AMPHISBAENA PERICENSIS Noble, 1921

Amphisbaena pericensis Noble, 1921, p. 141. Terra typica: "Perico, Peru."
HOLOTYPE: M.C.Z. 14631. PARATYPES: A.M.N.H. 28501-03; B.M. 1929.6.1, 85-RR 1946.8.31.83; C.A.S. 54614; C.N.H.M. 16106-07, 73371; D.Z. [?]; M.C.Z. 14764-65, 14767-68, 14770, 14772-75; S.M.F. 11826, 11887-88; U.I.M.N.H. 41494; U.S.N.M. 75970; Z.M.U. 29659 [Perico]. M.C.Z. 14789-90 [Bellavista]. U.S.N.M. 59926 [Chinchipe River]. U.S.N.M. 60057-58 [Marañon River].

Status of the types: The status of the various specimens collected by G. K. Noble is thoroughly confused, possibly because the collection does not appear to have been catalogued at the M.C.Z. in its entirety, and certainly because Noble neither gave the total number of specimens examined, nor otherwise identified the "paratypes." (See table on p. 13.)

There does not seem to be any difficulty about the holotype, M.C.Z. 14631. It was listed both by Noble and by Barbour and Loveridge (1929, p. 215).

The latter authors also listed M.C.Z. 14764-68, 14770, 14772-80 and 14789-90 as paratypes then remaining in the Museum of Comparative Zoology. A check of the catalog disclosed that the series originally ran from 14764 to 14790. Of these I have been able to identify 14764-65, 14767-80 and 14786-90 in various collections, relying always on the presence of one of the original parchment labels. Since 14766 is marked "Amaral" in the

M.C.Z. catalog (hence presumably in the Departamento de Zoologia, São Paulo collection = D. Z.), only 14781-85 remain in question.

All of the questionable specimens have their catalog entry marked "*Anomalocpis aspinosus* Taylor" in A. Loveridge's handwriting. The astonishing thing is that Dunn's first report (1923, p. 185) on the collection mentions only three specimens of *Anomalocpis*, while Taylor's original description (1939, p. 92) refers to six including 14781-85. Taylor apparently omitted mention of two other M.C.Z. specimens of this form, and the total of eight once in the M.C.Z. then suggests (1) that Dunn never saw M.C.Z. 14781-85, and (2) by implication that Noble did not check his "paratype" series very carefully. Nevertheless, the remaining 17 specimens may well be considered to be paratypes.

An even more complex problem is posed by seven specimens also supposedly from the Noble collections; four of these are labelled paratype, stem from Perico, and are respectively in the American Museum (A.M.N.H. 28501-03) and California Academy (C.A.S. 54614) collections. Since Noble was curator of the American Museum collection at the time they were catalogued, it remains possible that these are indeed part of his material. Less probability attaches to three specimens from the "Chinchipe River" (U.S.N.M. 59926) and the "Rio Marañon" (U.S.N.M. 60057-58). Stejneger marked the catalog "topoparatype" and these specimens were received from the M.C.Z., but were never catalogued there. Yet even they may be considered to have been included as paratypes by Noble's statement of species range.¹

Diagnosis: A form of *Amphisbaena* without major fusions of head shields; with pairs of very large first and slightly reduced second parietals; with the head relatively blunt and not particularly set off from the neck; with a cylindrical blunt-tipped tail; with a faint autotomy constriction at the sixth to eighth caudal annulus where autotomy takes place. The form has 198 to 218 body annuli; generally 18 or 19, occasionally 16 or 17 caudal annuli; 12 to 16 (generally 14) dorsal and 16 to 20 (generally 18) ventral segments to a midbody annulus; and 4 small

¹ Two specimens (U.M.M.Z. 55767 A & B) just discovered in the collection of the University of Michigan Museum of Zoology confirm that Noble apparently distributed "paratypes" without first giving them M.C.Z. numbers. Their jar contains an M.C.Z. label reading (apparently in Noble's hand) "Amphisbaena sp. nov. in ms. — Perico, N. W. Peru. — Harv. Peru. Exp." Their counts and measurements fall within the range of the present description.

round precloacal pores. The color of preserved specimens is a uniform dark brown, much darker dorsally than ventrally, lightened on the tip of tail and snout and produced by a dense pigmentation of the segments (contrasted by lighter intersegmental sutures).

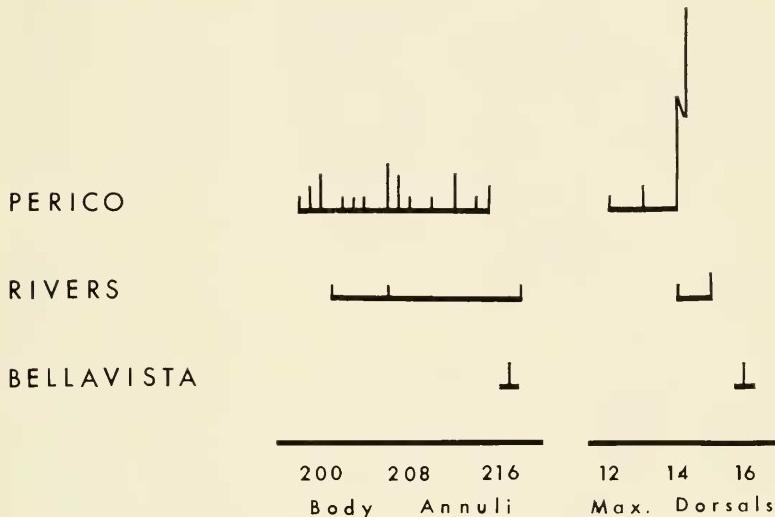


FIG. 2. *Amphisbaena pericensis*. Diagram showing distribution of counts of body annuli and maximum dorsal counts of the three groupings collected respectively at Perico, along the "rivers" of Chinchipe and Marañon, and at Bellavista.

Geographic variation: The entire sample comes from a relatively restricted area and 24 out of the 29 available specimens from the single locality, Perico. Two other specimens bear the definite indication Bellavista, while the other three are marked only with the names of the river courses traversing the area.

Number of segments to the dorsal portion of the midbody annulus differs clearly between the Perico sample (12 to 14) and the Bellavista sample (15 to 16). Two of the river course specimens also range to 15. It may also be significant that the two Bellavista specimens and one of the river course individuals show a slightly higher number of body annuli than does the Perico sample (Fig. 2). Here, as in so many other instances, we are handicapped by the markedly inadequate samples.

Description: Figure 3 shows views of the head, Figure 4 the ventral surface of the cloaca and tail, and 6, 7 and 8 are photographs showing coloration and other aspects of the specimens. Figure 5 gives a scatter diagram of tail versus snout-vent lengths. Meristic data are listed in the table.

This is a small species of *Amphisbaena*, of a dark brownish color and without pattern, but with marked dorsoventral counter shading. The lightened ventral color continues anteriorly onto the rostral, and caudally to the cloaca and occasionally to the distal tip of the tail. The color is clearly restricted to the segments, as the intersegmental sutures and the lateral grooves are significantly lighter. The specimens thus present the impression of a checkerboard under magnification.

The coloration appears to result from two levels of pigmentation and two degrees of expression. There is a general darkening of the entire segmental surface, plus an additional intensification of pigmentation on the rectangular segmental centers. The dorsal segments of some well preserved specimens barely show this midsegmental pigment dichotomy; other, possibly more faded, specimens show it more clearly though never as markedly as in *Amphisbaena silvestrii* (Gans, 1962) in which the margins are quite distinct from the centers. The dorsoventral fading occurs both by a general weakening of the coloration and by a complete dropping out of the main pigmentation by segments. (The absence of living specimens does not permit decision as to whether these ventral segments are truly unpigmented, or whether the phenomenon here discussed applies only to those pigments least affected by methods of preservation.) The general weakening of the pigmentation may result in disappearance or reduction to flecking of the darkening of the entire surface, as well as a reduction of pigment density and size of the rectangular segmental centers. The complete depigmentation varies in extent from a blanching of most midventral rows to that of scattered groups of ventral segments. Such areas as the tail are ventrally countershaded by the first phenomenon alone and all of their segments retain (more or less faint) dark centers.

The head segmentation is characterized by lack of major fusions, and by pairs of very large first and slightly reduced second parietals. The head is slightly flattened dorsoventrally particularly on the posterior half. The rostral region projects slightly across the tip of the recessed lower jaw. The entire body shows some dorsoventral flattening. The temporal muscles are

scarcely noticeable in juveniles, but are definitely swollen in adults in which they change the shape of the head.

The rostral is slightly smaller than are the first supralabials and only its dorsal tip is visible from above. Pairs of medium-

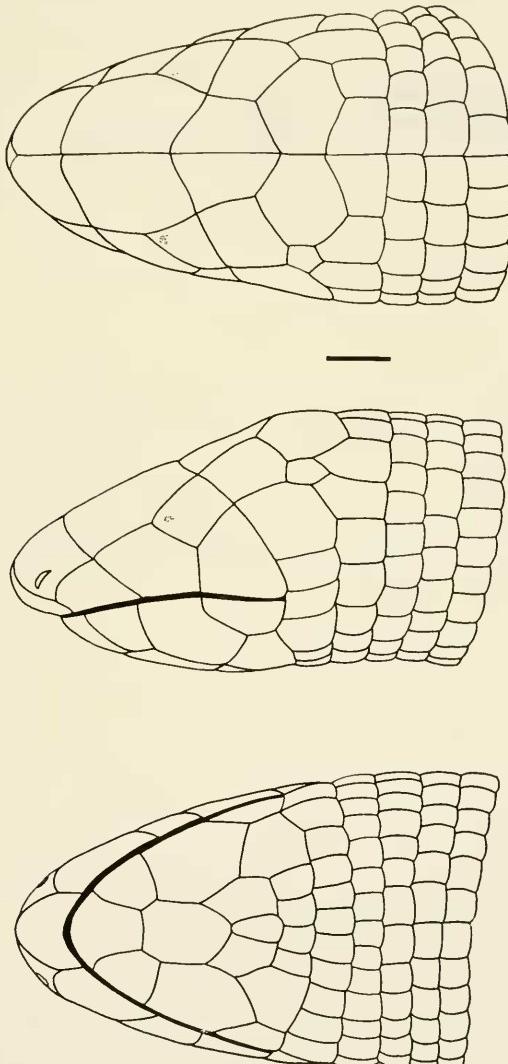


FIG. 3. *Amphisbaena pericensis*. Dorsal, lateral and ventral views of the head of the holotype, M.C.Z. 14631, from Perico. The line equals 1 mm to scale. (V. Cummings del.)

sized nasals, large prefrontals, smaller frontals and wide first and narrower second parietals follow in sequence along the dorsal midline of the head. The middle of the parietal lies on the level of the angulus oris. There are three supralabials of which the second is generally the largest. The position of the angulus oris lies at the posterior edge of this segment and is generally quite easy to determine as the intersegmental sutures of the first body annulus do not tend to align with the slit of the mouth. The suture between the first and second supralabials runs at an angle of 45° to the edge of the mouth, while that between the second and third runs directly rostrad or only very slightly anteriorly. The ocular is quadrangular, contacting the prefrontals and frontals anterodorsally, and the second and third supralabials anteroventrally. Its posterior margins adjoin the segments of the first body annulus.

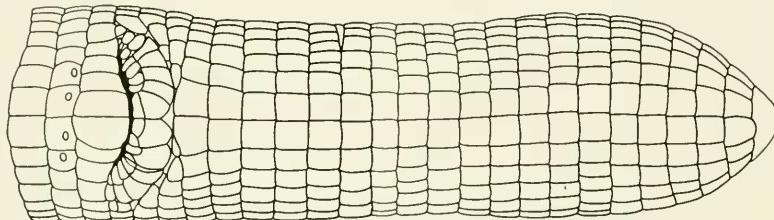


FIG. 4. *Amphisbaena pericensis*. Ventral view of cloaca and tail of the holotype. The line equals 1 mm to scale. (V. Cummings, del.)

The mental is medium sized and slightly larger than the first infralabials which are followed by the very large second infralabials (the largest segments of the lower jaw), and these in turn by the narrow third infralabials. The oval to pentagonal postmental is somewhat larger than the mental and is in contact with it, with the first and second pairs of infralabials, and with a row of postgenials that clearly exclude it from contact with the malars. The malars are small and fill the spaces between the wide second and narrow third infralabials. The anterior row of postgenials generally consists of two tear-drop shaped segments, occasionally separated by a small intermediate segment (indicated in the table under chin segments by a figure one in parenthesis). This segment occasionally contacts the postmental so that a first row of three postgenials is counted. The second postgenial row contains three to four segments. There are no postmalars.

Dorsally, the two pairs of very much enlarged segments of the first body annulus curve anteriorly and the topmost pair contacts the lateral edges of the frontals. A dorsal half-annulus of one to two segments on each side intercalates behind this, including the first parietals. The second parietals are the mid-

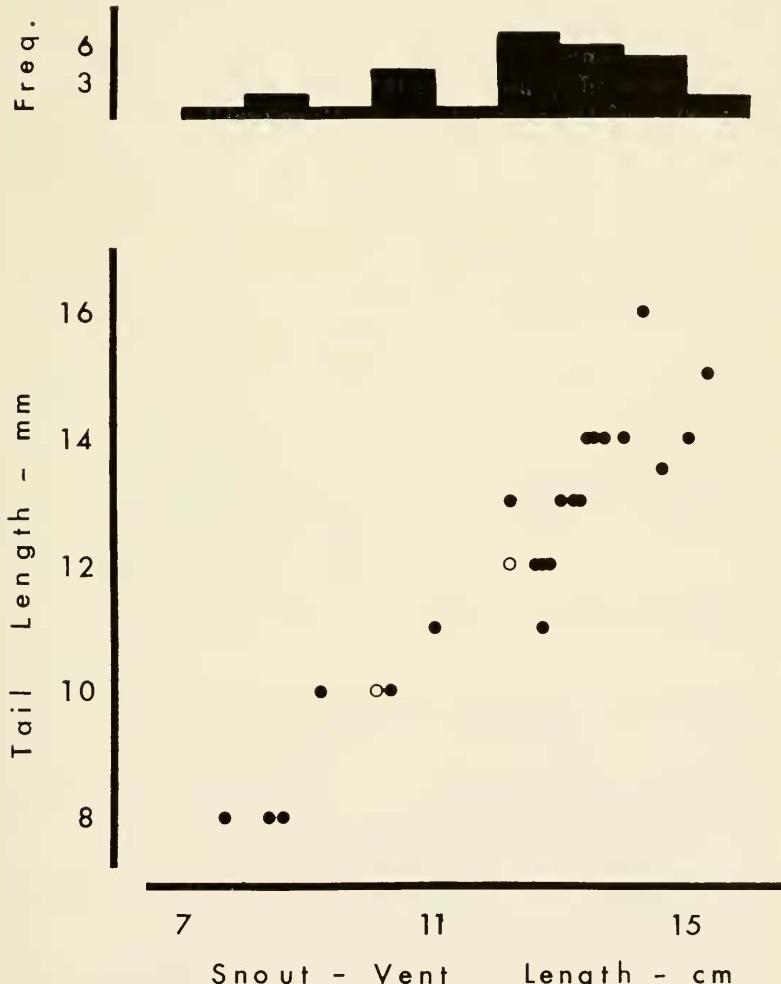


FIG. 5. *Amphisbaena pericensis*. Combined frequency histogram to show distribution of size classes of snout-vent length (summed in units of 1 cm, from 7.0 to 7.9, 8.0 to 8.9, etc.), and scatter diagram of tail versus snout-vent length (the hollow dots indicate two coincident points each).

dorsal segments of the second body annulus. The posterior edge of this annulus shows no forward curvature, though several of its segments are anteriorly elongate, particularly in the temporal region.

There are 198 to 218 body annuli from the back of the third infralabial, up to and including the pore-bearing precloacals. The fourth through sixth or eighth anterior annuli are modified. The anterior ones are shorter, and the posterior ones longer than the succeeding annuli on the trunk. There is generally no complexing of the segments in the "pectoral" region, nor are there intercalated dorsal half-annuli. There are 12 to 16 (generally 14) dorsal and 16 to 20 (generally 18) ventral segments to a midbody annulus, while the normal pattern appears to be 14/18 (see comments on geographical variation).

The cloacal region is characterized by 4 round precloacal pores, which are much less noticeable in juveniles and females. There are 6 to 8 precloacal and 11 to 14 postcloacal segments and three to five (generally four) lateral rows. The not particularly apparent autotomy annulus falls on the sixth to eighth postcloacal annulus and autotomy takes place here. Specimens have 16 to 19 (generally 18 to 19) caudal annuli. The cross section of the tail changes from a dorsoventrally flattened ellipse in the immediate postcloacal region, to a circle at the autotomy annulus, to an enlarged vertical ellipse behind this. The enlarged distal tip terminates in a blunt vertical keel.

The lateral sulci are clearly marked, starting between the twentieth and fortieth body annuli and continuing up to the level of the cloaca. At midbody, each of them is represented by little more than an elaboration of the normal intersegmental suture, which is made more complex by having the extreme corners of the adjacent segments diagonally cut off. The dorsal and ventral intersegmental sutures are aligned along the middorsal and midventral region, but there is no other indication of dorsal and ventral sulci.

The dorsal segments of a midbody annulus are approximately one and one-half times as long as wide, while the ventral ones are one and three-quarter times as wide as long.

Range: Peru, Department of Cajamarca, "arid valleys of the Chinchipe and Marañon, from Perico on the north to Bellavista on the south."

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Data for specimens of Amphisbaena pericensis Noble

Collection and number	A N N U L I Body/Lat/Tail	SEGMENTS Dors/Vent	Chin Segments	Cloaca	Length
AMNH 28501	204+5+(6) 18	14/18	2-4	4-6-13	132+13
AMNH 28502	200+4+(6) 16	13-4/18	2(1)-4	4-6-13	146+13.5
AMNH 28503	212+4+(7) 18	14/18-20	2-3	4-6-12	128+12
BM 1929.6.1.85 -					
RR 1946.8.31.83	202+4+(7) 18	14/18	irreg.	4-7-13	140+14
CAS 54614	214+4+(7) 18	14/18	2-3	4-8-12	150+14
CNHM 16106	198+4+(7) 19	14/18-19	2(1)-4	4-8-12	134+14
CNHM 16107	207+4+(7) 18	13-4/18	2(1)-4	4-6-11	101+10
CNHM 73371	203+4+(7) 18	12-3/18	2(1)-4	4-8-12	110+11
MCZ 14631	208+4+(7) 19	14/20	3-4	4-8-12	137+14
MCZ 14764	212+5+(6) 18	12/18	2-3	4-8-12	153+15
MCZ 14765	200+4+(6) x	14/18	3-4	4-7-12	104+(3)
MCZ 14767	206+4+(7) 18	14/18	2-4	4-8-14	77+8
MCZ 14768	199+4+(6) 18	12-14/18	2-4	4-7-12	103+10
MCZ 14770	200+4+(6) 17	14/16-8	2-4	4-8-13	122+12
MCZ 14772	206+ $\frac{3}{4}$ +(7) 19	12-3/17-8	2-3	4-7-12	127+12
MGZ 14773	207+ $\frac{3}{4}$ +(7) 19	13-4/18	2-3	4-8-15	135+14
MCZ 14774	212+4+(7) 18	12-4/18	2-4	4-8-12	86+8
MCZ 14775	215+4+(6) x	14/18	2-4	4-7-12	142+6
SMF 11826	215+4+(7) 19	14/16-8	2(1)-4	4-7-13	122+13
SMF 11887	206+ $\frac{3}{4}$ +(7) 18	14/18	2-3	4-8-11	92+10
SMF 11888	206+4+(7) -	13-4/18	2(2)-5	4-8-13	127+11
UIMNH 41494	210+4+(7) 18	13-4/17-8	2-4	4-8-12	84+8
USNM 75970	207+4+(7) 18	12-4/18	2(1)-4	4-7-13	101+10
ZMU 29659	199+4+(6) 18	13-4/18	2(1)-3	4-6-12	122+12
MCZ 14789	217+3+(6) 17	16/18	2(1)-4	4-8-13	133+13
MCZ 14790	217+3+(7) 19	15-6/18-20	2(1)-4	4-7-12	130+13
USNM 59926	201+ $\frac{4}{3}$ +(8) 19	13-5/18	2-3	4-8-12	143+16
USNM 60057	218+4+(7) x	14-5/20	2(1)-4	4-8-14	142+(5)
USNM 60058	206+ $\frac{3}{4}$ +(7) 18	12-4/18	2-3	4-8-11	126+12

Present status of the M.C.Z. paratypes of *A. pericensis*.

<i>Original number</i>	<i>Present number</i>
14764-65	Same
14766	"Amaral" = D.Z. ?
14767-68	Same
14769	Z.M.U. 29659
14770	Same
14771	S.M.F. 11826
14772-75	Same
14776	U.L.M.N.H. 41494
14777-79	C.N.H.M. 16106-07, 73371
14780	B.M. 1929.6.1.85-RR 1946. 8.31.83
14781-85 = <i>Anomalepis</i>	M.C.Z. and U.S.N.M.
14786	U.S.N.M. 75970
14787-88	S.M.F. 11887-88
14789-90	Same

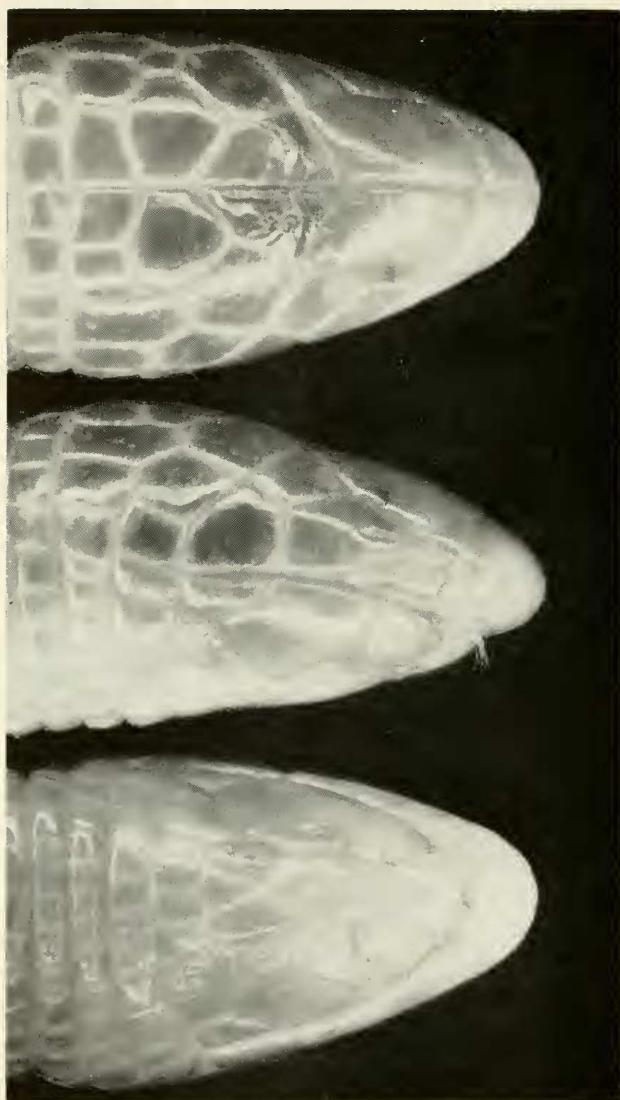


FIG. 6. *Amphisbaena pericensis*. Dorsal, lateral and ventral views of the head of the holotype, M.C.Z. 14631.

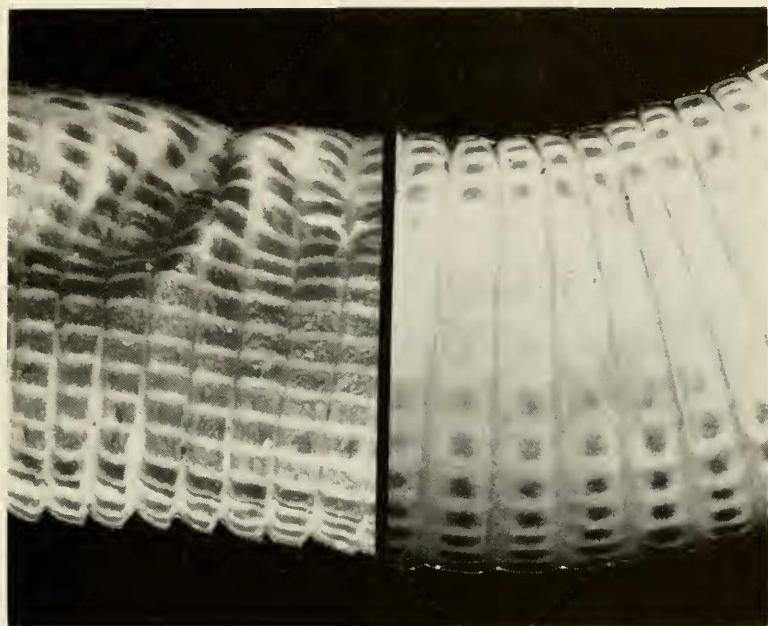


FIG. 7. *Amphisbaena pericensis*. Dorsal (left) and ventral (right) views of the holotype at midbody to show size and pigmentation of segments.

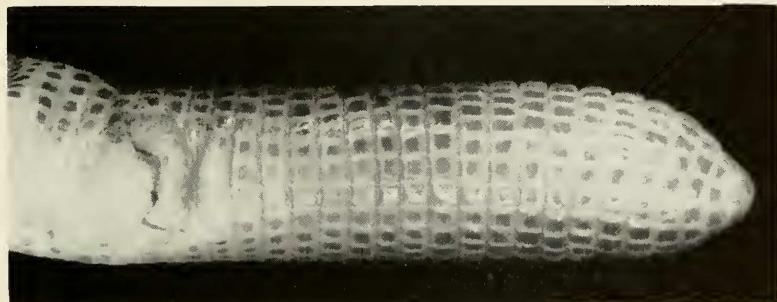


FIG. 8. *Amphisbaena pericensis*. Ventral view of cloaca and tail of the holotype, to show pigmentation, segment arrangement and the hardly apparent autotomy constriction.